

REMARKS/ARGUMENTS

Claims 1, 4-6, 8-9, 11, 21, 24, 27, 30, and 33-41 are pending.

Claims 2-3, 7, 10, 12-20, 22-23, 25-26, 28-29, and 31-32 are cancelled.

Claims 21, 24, 33-36, and 40-41 have been withdrawn.

Claims 1, 4-6, 8, 16-18, 27, 20, and 37-39 are rejected under 35 U.S.C. 103(a) over Matsuo et al., US 4,259,092, Susumu et al., JP 2001-240407, and Kosaka et al., US 5,039,651 (Kosaka I). The rejection is traversed because

(1) the combination of the references does not describe or suggest:

(a) the claimed element comprising a honeycomb-shaped activated carbon paper obtained by molding a composition comprising a binder and activated carbon (i) satisfying $b/a = 0.3$ through 0.55 and (ii) adsorbing and desorbing gasoline vapor (e.g., claim 1);

(b) the claimed element, wherein the binder comprises the pulp and two polyvinyl alcohol (PVA)-based binder fibers, a ratio of the activated carbon/pulp/first PVA/second PVA is 60/20/10/10, and the second PVA-based binder fiber provides fire retardancy (claims 37-41); and

(2) the activated carbon of the cited references does not inherently possess the claimed b/a ratio because it is produced by a different method (using water vapors, carbon monoxide and carbon dioxide) and is inferior in the adsorption and desorption of gasoline vapor;

(3) modifying the element of the cited references with a reasonable expectation to obtain the claimed ratio would not have been obvious because the claimed element achieves a different goal; and

(4) the claimed b/a ratio is not result-effective variable.

(1) The cited referencers do not describe or suggest explicitly or inherently the claimed element.

Advantages of the claimed element.

The present specification describes that the claimed honeycomb-shaped activated carbon paper reduces the leak amount of fuel vapor, provides a low pressure drop (increase in the pressure drop results in lengthening the fuel feeding period) and excellent moldability and strength (pages 1-2, 5-8). To achieve these characteristics, the activated carbon has to possess an excellent adsorption and desorption property (pages 2, 5-6, 7), which is achieved by using the claimed activation method providing the ratio of b/a from 0.3 to 0.55, and a honeycomb-shaped activated carbon paper. Carbon can be activated, for example, in gas atmosphere (e.g., steam, carbon dioxide, oxygen) (see page 15 and the Examples).

Further, a binder comprising pulp and PVA-based binder possessing fire retardancy is used to prevent the element from flaming caused by an exposure to a high temperature (e.g., pages 17 and 21 of the present specification).

In addition, the claimed honeycomb-shaped activated carbon paper is advantageous with respect to the resistance against shock provided by interlocking the binder fibers with the activated carbon without clogging of pores on the activated carbon surface. When a vehicle is parked, gasoline vapor generated from a gasoline tank is adsorbed by activated carbon filled in a canister. However, when a vehicle is parked for a long period of time, the adsorbed gasoline, with the passage of time, moves from the inlet side to the outlet side of the canister and evaporates into the atmosphere by a difference in the gaseous phase concentration of gasoline vapor between the inlet side and the outlet side in the canister.

It is undesirable, in terms of environmental pollution, that gasoline evaporates into the atmosphere. In the USA, since 2004, vehicle fuel evaporation control regulations called Tier 2, and in California, called LEV II have been enforced. According to these regulations, the

evaporative emission of gasoline while parking for 72 hours, that is, Diurnal Breathing Loss (DBL) is reduced to a value remarkably lower than conventionally. Furthermore, p-ZEV (Partial Zero Emission Vehicle) regulation requires a canister to satisfy an emission value of 5 through 15 mg (page 5, lines 5 to 20, of the present specification).

An object of the present invention is to provide an activated carbon paper honeycomb molding, which can reduce the leak amount of evaporated fuel such as gasoline and has low pressure drop and excellent moldability and strength, and a method for producing this, and to provide an element for a fuel evaporative emission preventing device for preventing the release of the fuel evaporative emission from a fuel tank system and an intake system by using said activated carbon paper honeycomb molding (page 8, line 20 to page 9, line 4 in the original English text).

A conventional canister having a filled adsorbent such as activated carbon *cannot satisfy the above strict regulations*. However, according to the present invention, such strict regulations can be complied with by using an activated carbon paper honeycomb molding defined based on the ratio of specific concentration n-butane adsorbing amounts, as an element for fuel evaporative emission preventing devices in combination with the conventional canister; and further the fuel evaporative emission from the intake system can be prevented from evaporating and a fuel evaporative emission preventing device having suitable strength can be provided by installing the activated carbon paper honeycomb molding in the intake system.

The adsorption capacity of fuel vapors such as gasoline has been conventionally represented by Butane Working Capacity (BWC) measured based on ASTM-D5228, and generally, a higher BWC is excellent as adsorption capacity (page 11, lines 12 to 15, in the specification). Accordingly, a canister having an excellent gasoline adsorption capacity can be obtained by increasing the BWC. However, in a parked vehicle, to prevent movement by

a difference in gaseous phase concentration of gasoline vapor, just increasing the activated carbon amount may pose such problems as an increase in pressure drop and longer fueling time.

The element for fuel evaporative emission preventing devices including the activated carbon paper honeycomb molding according to the present invention is a breakthrough achievement that can clear the strict regulations only by attaching the element to the conventional canister or installing the element in the intake system, and has no problem in terms of strength. That is, the present invention is characterized by the element for fuel evaporative emission preventing devices which was made by consideration of highly concentrated n-butane adsorption capacity and low concentrated n-butane adsorption capacity, the element including the activated carbon paper honeycomb molding which is applicable to the strict regulations and has no problems in terms of strength (page 11, lines 12 to 20 in the specification).

In consideration of the strict regulations regarding gasoline evaporative emission, the present invention relates to the element, which is used in combination with the conventional canister, for preventing evaporative emission of gasoline vapor into the atmosphere from a gasoline tank or intake system in line with parking of a vehicle for a long period of time, and a producing method for the same. The present invention was made by newly finding that selection of activated carbons suitable for activated carbon paper honeycomb molding for preventing movement due to a difference in gaseous phase concentration of absorbed gasoline vapor is defined by a ratio between high n-butane concentration and low n-butane concentration. A selection of such activated carbon cannot be generally decided by conventional physical properties of activated carbon and manufacturing conditions of activated carbon, and it is required to use activated carbons which satisfy the ratio between n-butane concentrations specified in the present invention.

The activated carbon paper honeycomb molding of the present invention satisfies a specific range (b/a) when 100%-concentration n-butane adsorbing amount per 100 parts by weight of activated carbon at 40° C is defined as a parts by weight and a 1%-concentration n-butane adsorbing amount per 100 parts by weight of activated carbon at 40° C is defined as b parts by weight. The technical meaning resides in newly finding that the molding of the present invention can be distinguished from the conventional moldings according to an inclination of the straight line when 1% and 100% butane concentrations are indicated on an abscissa and the butane adsorbing amounts b and a respectively corresponding to the butane concentrations are indicated on an ordinate.

Thus, the element according to the present invention is preferably used for a second canister or an engine air intake. It is essential that the element adsorbs the gasoline vapor emitted from a gasoline tank or an intake system when a vehicle is parked for a long period of time. When the engine is at work during driving, the gasoline adsorbed should be desorbed. Thus, is essential that the element must provide the advantageous adsorption and desorption of the gasoline.

The claimed element for a fuel evaporative emission preventing device was made by considering a highly concentrated n-butane adsorption capacity and low concentrated n-butane adsorption capacity, wherein the claimed element includes the activated carbon paper honeycomb molding which satisfies restrict regulations and has no problems in terms of strength (page 11, lines 12 to 20 in the original English text).

Disclosure of the cited references and comparison to the claimed element.

(A) **Matsuo et al.** disclose a multi-layer member comprising multiple corrugated boards. The adsorptive member in Matsuo et al. is used generally in the waste gas treatment field. Therefore, Matsuo et al. provide an adsorptive member having a high volume efficiency of the adsorption capacity and a small pressure loss (column 1, lines 43-45).

Further, Matsuo et al. describe that the activated carbon fiber is required to possess the equilibrium adsorption amount of benzene of more than 200 mg/g and the *benzene adsorption rate* constant of more than 0.2 min^{-1} (col. 1, lines 49-54). The Examples of Matsuo et al. describe passing an air containing xylene, humid air or carbon monoxide through the filter (Examples 1-4).

Matsuo et al. do not describe or suggest “adsorption and desorption of gasoline”. Matsuo et al. do not describe or suggest an element for a fuel evaporative emission preventing device, much less an activated carbon sheet satisfying “ $b/a=0.3$ through 0.55 ” (adsorption of n-butane).

Further, Matsuo et al. describe that the carbon fibers are activated under the atmosphere containing water vapors, carbon monoxide and carbon dioxide at 500°C or higher (col. 2, lines 24-28).

As shown in the Declaration of Kenichi Ishikawa submitted on July 2, 2008, when carbon is activated in the atmosphere of carbon monoxide and carbon dioxide or steam and carbon monoxide (as in Susumu et al.), the activated carbon does not possess the claimed b/a ratio (also see the response filed February 17, 2009, pages 17-20, demonstrating that the b/a ratio is not inherent even if the same raw materials are used because a method of activation of carbon is important and the claimed activated carbon is activated without the presence of carbon monoxide).

Thus, the carbon of Matsuo et al. is activated in a similar fashion as in Susumu et al. and, therefore, the activated carbon of Matsuo et al. is expected to have inferior gasoline adsorption and desorption properties and the b/a ratio outside the claimed range (as shown for the carbon of Susumu et al. in the previously submitted Declaration).

(B) **Susumu et al.** describe an activated carbon capable of efficiently adsorbing small molecular weight materials such as hydrogen and nitrogen and a method of carbon activation

(see page 1 of the automated English translation, Field of Invention). The described method provides for a uniform small pore diameter of the activated carbon for adsorbing the small molecular matter efficiently (see page 1, Problems to be Solved; and [0007]-[0008], [0012]-[0013], [0017]). The surface area of the activated carbon is 500-3000 m²/g (see [0007], [0017], Table 1) and the adsorption quantity of nitrogen is 10 ml/g or more at 25 °C and 1 atm (see [0007], [0017], Table 1).

Thus, Susumu et al. disclose activated carbon having a sharp peak in the pore distribution that is suitable for adsorption of a small molecule gas such as nitrogen but is unsuitable for adsorption and desorption of gasoline vapors due to its small micropore size.

Although Examples 15 to 18 and Comparative examples 16 to 19 of Susumu et al. describe that the butane working capacities were measured, the Declaration which was previously filed by one of the inventors, Ishikawa, reveals that the activated carbon of the invention of Susumu et al. does not satisfy the specific range (b/a).

Susumu et al. describe a binder such as a powder or tar, a pitch, a phenol resin, or a grain (see [0010]).

Susumu et al. do not describe an element comprising a honeycomb-shaped activated carbon paper obtained from an activated carbon satisfying $b/a = 0.3$ through 0.55.

Susumu et al. do not describe the specific claimed binder comprising (i) pulp and at least one polyvinyl alcohol (PVA)-based binder fiber providing fire retardancy; (ii) pulp and two polyvinyl alcohol (PVA)-based binder fibers, a ratio of the activated carbon/pulp/first PVA/second PVA is 60/20/10/10, and the second PVA-based binder fiber provides fire retardancy.

Susumu et al. do not disclose that the described activated carbon can adsorb and thereafter desorb gasoline vapor which is an important factor in preventing a fuel evaporation emission (see the present specification pages 1-9). It is impossible to adopt the Susumu et al.

activated carbon for an element for a fuel evaporation emission preventing device because it is inferior in the adsorption and desorption of gasoline vapor which is important in preventing a fuel evaporation emission.

Also, although small pores are desirable for filtering small molecules as in Susumu et al. (e.g., nitrogen gas), clogging pores having a small diameter on the activated carbon surface is a problem.

Also, the Examiner is of the opinion that the Susumu et al. activated carbon can be used for adsorption and filtration in fuel systems for automobile engines. However, the present invention does not provide such an absorbent or filter, but provides an element for a fuel evaporation emission preventing device. The claimed element is neither a filter nor merely adsorbent of small materials, but is an adsorbent and desorbent of the gasoline vapor.

Susumu et al. describe that the activated carbon capable of efficiently adsorbing small molecular weight materials such as hydrogen and nitrogen can be used for a gasoline adsorption canister. However, the claimed second canister should be distinguished clearly from the general canister disclosed in Susumu et al. The present second canister is used for preventing the gasoline vapor adsorbed in the first canister from evaporating into the atmosphere by a difference in the gaseous phase concentration of gasoline vapor between the inlet side and the outlet side in the canister. The second canister according to the present invention is made of a honeycomb-shaped activated carbon paper satisfying a specific ratio (b/a). The second canister is used by connecting to a first canister in series.

It is the first canister that is described in Susumu et al. Susumu et al. do not describe or suggest the second canister or an engine intake element made of the honeycomb-shaped activated carbon paper, much less the second canister or engine intake element having a specific "b/a".

Whether two canisters are connected in parallel or in series is very important. The second canister must be necessarily connected to the general canister (the first canister) in series. A second canister could not display its ability if the second canister was connected to the first canister in parallel.

Thus, substituting the element of Matsuo et al. with that of Susumu et al. still does not produce the claimed element (i) having the claimed b/a ratio, (ii) that can adsorb a gasoline vapor and desorb the absorbed gasoline vapor, and (iii) a second canister comprising the claimed element and connected to the first canister sequentially.

(C) **Kosaka I** describes an organic solvent recovery process (col. 1). The Kosaka I carbon is activated chemically at a temperature of 100-160°C and shaped at 90-160 °C followed by calcinations, washing and drying the shaped product by conventional methods (col. 1, line 64 to col. 2, line 7; and Example 1). Thus, the activation method is different from the claimed method and, therefore, the Kosaka I activated carbon does not necessarily have the claimed ratio b/a and the gasoline adsorption and desorption.

Kosaka I describe determining the effective amount of adsorption of n-butane comprising passing 99.9% pure n-butane through a column at a flow rate of 250 mg/min for 15 min, removing the column, checking the weight (B), setting the column again, running dry air at 190 ml/min for 20 min, removing the column and checking the weight (C). The effective amount of adsorbed n-butane is $B-C/V \times 100$ (g/100 ml). The desired effective amount of adsorbed n-butane is 5-15 g/100 ml (col. 3, lines 21-29).

The claimed ratio b/a is determined as follows:

The n-butane adsorbing amount a is determined by putting 10g of activated carbon in a glass column, circulating 100%-concentration n-butane at 1 L/min until it reaches equilibrium, and measuring the n-butane adsorbed amount in weight. The n-butane adsorbing amount b is determined by putting 10g of activated carbon in a glass column, circulating 1%-concentration n-butane obtained by diluting 100%-concentration n-butane with air at 1 L/min until it reaches equilibrium,

and measuring the adsorbed n-butane in weight. The value of b/a of the activated carbon forming the activated carbon sheet molding of the invention is 0.3 through 0.55. (Pages 10-11 of the present specification).

The molding of the present invention can be distinguished from the conventional moldings according to an inclination of the straight line when 1% and 100% n-butane concentrations are indicated on an abscissa and the butane adsorbing amounts (b) and (a) respectively corresponding to the butane concentrations are indicated on an ordinate. The claimed ratio " b/a " means an excellent adsorption and, desorption property in the second canister or an engine intake element distinguishable from the conventional ones by the inclination of the straight line.

Thus, the n-butane test described in Kosaka I and the test of the present specification are different.

Further, the goal of Kosaka I is achieved by the carbon activated by a method different from the claimed method. As shown in the Declarations submitted previously and the response filed on February 17, 2009, carbon activated by a different method does not necessarily has the claimed properties (e.g., the b/a ratio). However, the carbon activated by a different method works well and also has the desired effective amount of adsorption of n-butane in Kosaka I.

Also, the Examiner is of the opinion that the products of Matsuo et al., Susumu et al., and Kosaka I are similar to the claimed activated carbon and element and, therefore inherently (necessarily) have the claimed properties. Applicants respectfully disagree because the activation and molding methods in Matsuo et al., Susumu et al., and Kosaka I are different from the that claimed. As shown in Declarations submitted previously and response filed on February 17, 2009, carbon activated by a different method does not necessarily has the claimed b/a ratio and adsorption and desorption of gasoline.

The legal requirement for inherency is that the Matsuo et al., Susumu et al., and Kosaka I activated carbon product necessarily (i.e., each and every time the product is produced) has the b/a ratio of 0.3-055. In a recent decision, the Board stated that when the claimed and prior art compositions comprise similar components used in overlapping ranges, even if some of the art compositions might have the claimed properties, that possibility is not adequate to support a finding of inherency. *Ex parte Thomas*, Appeal 2007-4423 (July 23, 2008). The Examiner must provide some evidence to establish the reasonableness of the examiner's believe that the functional limitation is inherent. *Id.*

Applicants have shown in the previously submitted Declaration and response that, for example, Brownhill et al. and Susumu et al.'s activated carbon products do not necessarily possess the claimed b/a ratio.

Even if some of the art compositions *might* have the claimed properties, that possibility is not adequate to support a finding of inherency. *Ex parte Thomas*, Appeal 2007-4423 (July 23, 2008).

Thus, the cited references do not explicitly or inherently describe the claimed element.

(2) One would not have modified the element of the cited references with a reasonable expectation to obtain the claimed element.

One would not have been motivated to modify the disclosure of the cited references to achieve the claimed element because (i) the goals of achieved by Matsuo et al., Susumu et al., and Kosaka I, and the claimed element are different, and (ii) the carbons of the cited references work well for the intended purposes of Matsuo et al., Susumu et al., and Kosaka I.

One would not have reasonably expected to achieve the claimed element that possesses the claimed b/a ratio and adsorb and desorb gasoline vapors because (i) the Matsuo et al., Susumu et al., and Kosaka I use different method of the carbon activation and molding, (ii) the art elements achieve a different goal, (iii) Kosaka I n-butane test is different, and (iv)

there are unlimited combinations of a large number of parameters that can be modified in the Matsuo et al., Susumu et al., and Kosaka I element/methods, wherein the result is unpredictable.

More specifically, Susumu et al. concern forming an activated carbon having a small pore diameter so as to efficiently adsorb small molecular weight materials such as nitrogen gas, which is achieved by activating carbon under an atmosphere that contains carbon dioxide and carbon monoxide.

Matsuo et al. is used generally in the waste gas treatment field. Matsuo et al. provide an adsorptive member having a high volume efficiency of the adsorption capacity and a small pressure loss. The Matsuo et al. activated carbon fiber is required to possess the equilibrium adsorption amount of benzene of more than 200 mg/g and the benzene adsorption rate constant of more than 0.2 min^{-1} (col. 1, lines 49-54). Matsuo et al. achieve the goal by activating the carbon fibers under the atmosphere containing water vapors, carbon monoxide and carbon dioxide at 500 °C or higher (col. 2, lines 24-28).

Kosaka I and II's goal is to remove organic compounds and provide good working capacity and durability (col. 1-2).

The present invention concerns reducing the leak amount of fuel vapor and providing a low pressure drop (increase in the pressure drop results in lengthening the fuel feeding period), excellent moldability and strength, and the resistance against shock provided by interlocking the binder fibers with the activated carbon without clogging of pores on the activated carbon surface.

Also, there are unlimited combinations of a large number of parameters of the prior art elements that can be possibly modified to vary characteristics of the activated carbon-based element to achieve a variety of goals. Therefore, one would not have reasonably expected obtaining a reduced leak amount of fuel vapor and a low pressure drop, excellent

moldability and strength, and the resistance against shock without actually conducting experiments because one would have to choose from a large number of parameters and solutions which are not predictable based on the disclosure of the cited references. *KSR International Co. v. Teleflex Inc.*, 127 S.Ct 1727 (2007).

In a recent decision, the Board stated that “[t]o the extend an art is unpredictable, as the chemical arts often are, *KSR*’s focus on these “identified, predictable solutions” may present a difficult hurdle because potential solutions are less likely to be genuinely predictable.” *Eisai Co, Ltd. v. Dr. Reddy’s Lab.*, 533 F.3d. 1353 (Fed. Cir. July 21, 2008).

In addition, the claimed ratio b/a provides advantageous results (see Tables 1 and 2 of the present specification the Declarations submitted previously comparing the claimed element of the Examples and the products of the Comparative Examples, wherein when the ratio b/a is within the claimed range, the element has superior properties).

Moreover, the claimed element uses an honeycomb-shaped activated carbon paper satisfying the p-ZEV regulatory requirements (*see* page 5, line 16, to page6, line 11). According to the p-ZEV, the vehicles must meet the stringent ZEV emission requirements (see page 5, lines 16-20, and the attached PZEV Emission Technology sheets). To meet the ZEV requirements, the inventors found that it is necessary for the activated carbon to satisfy $b/a = 0.3-0.55$. To satisfy the claimed ratio, activation conditions have to be tightly controlled (*see* the Examples in the present specification). For example, if coconut shells are used as a carbonaceous material, the activated carbon obtained by a short-time steam activation shows good adsorption capacity, but does not satisfy the claimed ratio, and, therefore. Also, the activated carbon obtained by a long-time steam activation shows good desorption capacity, but does not satisfy the claimed ratio. Consequently, both activated carbons do not satisfy the ZEV requirements (*see* the Examples in the present specification).

PZEV was adopted in 1998 as part of LEV II (*see* the attached PZEV Emission Technology sheets).

Matsuo et al. and Kosaka I did not recognize the ZEV requirements because it was not adopted at the time of filing (1977 and 1989) and developing the activated carbon satisfying the ZEV stringent requirements was not necessary.

Thus, Matsuo et al. and Kosaka I would not have been motivated to modify the element to tightly control gasoline vapor emission at even parked vehicles because the p-ZEV regulatory requirements have not been implemented at the time of the Matsuo et al. and Kosaka I inventions.

(3) The claimed b/a ratio is not result-effective variable.

For optimizing the ratio b/a, the prior art must first recognize a particular parameter as a result-effect variable, i.e., that a reduction of the leak amount of fuel vapor and a low pressure drop is a function of the ratio b/a.

Kosaka I describes a test for determining the effective amount of adsorption of n-butane which is desired to be 5-15 g/100 ml (col. 3, lines 21-29) for providing desired working capacity and durability of the element (col. 1, lines 47-50). The test is different. Kosaka I do not recognize the dependency of the reduction of the leak amount of the fuel vapor and a low pressure drop in the parked vehicle from the ratio b/a determined as described in the present specification.

In a recent decision, the Board stated that while the discovery of an optimum value of a variable in a normally obvious, this is not always the case. *Ex parte Thomas*, Appeal 2007-4423 (July 23, 2008). One exception to the rule is where the parameter optimized was not recognized in the prior art as one that would affect the results. *Id.* The Examiner has to point to a teaching in the cited reference or provide any explanation based on scientific reasoning,

that would support the conclusion that those skilled in the art would have considered it obvious to optimize the prior art composition to the level recited in the claims. *Id.*

Thus, optimizing the b/a ratio is not routine.

Concerning claims 37-41, directed to the element, wherein the binder comprises the pulp and two polyvinyl alcohol (PVA)-based binder fibers, a ratio of the activated carbon/pulp/first PVA/second PVA is 60/20/10/10, and the second PVA-based binder fiber provides fire retardancy. The Examiner is of the opinion that it is obvious to combine two binders as in the claimed element and optimize their ratio (page 6 of the OA). Applicants respectfully disagree.

Matsuo et al. describe the activated carbon fibers produced by treating the material fibers such as the PVA fiber with a flame-resistant agent (col. 1, lines 62-68). Matsuo et al. do not describe or suggest that combining two PVA fibers and treating with the fire-resistant agent only one PVA fiber is somehow advantageous compared to using only one PVA fiber that is treated. In fact, the Examples of Matsuo et al. use only activated carbon, polyacrylonitrile pulp and the PVA fiber which was not treated with the fire-resistant agent (a ratio is 70 (carbon):20 (pulp):10% (PVA) (col. 6). This composition works well and removes a desired amount of xylene, humid air and carbon monoxide (Examples 1-4). Thus, one would not have been motivated to modify the composition of Matsuo et al. because it works well for its intended use. One would not have reasonably expected to obtain the claimed composition based on the disclosure of Matsuo et al. (or a combination of the cited references) because there are many ways to modify the Matsuo et al. elements, the results of the modifications are unpredictable and one would not have known that combining the binders as in the claimed composition would have necessarily achieved the claimed properties without actually conducting experiments.

Thus, Matsuo et al., Susumu et al., and Kosaka I do not make the claimed element obvious.

Claims 9 and 11 are rejected under 35 U.S.C. 103(a) over Matsuo et al., Susumu et al., Kosaka I, and Kosaka et al., US 5,118,329 (Kosaka II). The rejection is traversed because the combination of the references does not describe or suggest (i) an element comprising two canisters connected consecutively, wherein one canister comprises the claimed honeycomb-shaped activated carbon paper and another canister comprises granular activated carbon, and (ii) an engine air intake element.

The disclosure of Matsuo et al., Susumu et al., and Kosaka I is discussed above. Kosaka II does not cure the deficiency.

Whether two canisters are connected in parallel or in series is very important. The second canister must be necessarily connected to the general canister (the first canister) in series. A second canister could not display its ability if the second canister was connected to the first canister in parallel.

Kosaka II discloses a chemically activated shaped carbon. Kosaka II discloses in FIG. 2 a solvent recovery process with two activated carbon layers arranged in parallel. However, the two activated layers of Kosaka et al. include the same activated carbon. Thus, the canisters are arranged to switch (alternate) properly for a continuous operation. Thus, a solvent to be recovered do not pass through two canisters sequentially, but passes one canister or the other because a goal of the element of Kosaka II is to provide a good working capacity and durability of the process of recovering organic compounds (col. 1, lines 52-58), while the goal of the claimed element is to reduce the leak amount of evaporated fuel and to provide a low pressure drop and excellent moldability and strength (page 8, line 20 to page 9,

line 4 in the original English text), which can be achieved by sequentially connoting the claimed canisters.

Although Kosaka II disclose a two canister system illustrated at Fig. 1, Kosaka II do not disclose that a first canister comprises granular activated carbon and a second canister comprises the claimed honeycomb-shaped activated carbon paper, wherein the canisters connected consecutively.

The claimed canister arrangement satisfies the required ZEV emission values even when a vehicle is parked (page 5-6 of the specification). The Kasaka I canisters are connected in parallel, do not comprise different activated carbon, and perform well for the intended purpose, i.e., to recover of hydrophobic organic compounds with good working capacity and durability (col. 1-2).

PZEV was adopted in 1998 as part of LEV II (*see* the attached PZEV Emission Technology sheets). Kosaka II did not recognize the ZEV requirements because it was not adopted at the time of filing (May 14, 1991) and developing the activated carbon satisfying the ZEV stringent requirements was not necessary.

One would not have been motivated to use the canisters connected sequentially and a first canister comprising granular activated carbon and a second canister comprising the claimed honeycomb-shaped activated carbon paper based on the disclosure of the cited references (e.g., Kosaka I and II) because a goal of Kosaka I and II is merely recovering a solvent by using two alternated activated carbon layers in parallel, while the claimed canister prevents the gasoline vapors from emitting to the atmosphere for 72 hours.

Further, Kosaka I only discloses a solvent recovery process, in which two activated carbon layers are used in parallel (col. 1 and FIG. 2). This means the activated carbon layers are used alternately by changing at timely intervals in the solvent recovery process. The second canister means little without connecting to the first canister in series. In FIG. 2, 11 is

an activated carbon layer, 12 is a condenser, 13 is a separator, 14 is steam, 15 is a gas containing solvent, 16 is a solvent, 17 is water, and 18 is an exhaust (col. 6, lines 14-18). Thus, it is clear that FIG. 2 does not suggest a canister which adsorb and desorb a gasoline vapor accompanied by stopping and starting of the vehicle engine, much less a second canister at all.

In addition, the combination of the cited references does not describe the claimed element inserted in the second canister. Thus, Matsuo et al., Susumu et al., and Kosaka I and II do not make the claimed element obvious.

Applicants request that the rejection be withdrawn.

Applicants note that the Examiner has cited two new references that have not been cited previously (or submitted by Applicants), Matsuo et al., US 4,259,092 and Kosaka et al., US 5,039,651. **Applicants request that the Examiner provides the PTO 892 form citing these references.**

A Notice of Allowance for all pending claims is requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



Marina I. Miller, Ph.D.
Attorney of Record
Registration No. 59,091

Customer Number

22850

Tel: (703) 413-3000
Fax: (703) 413-2220
(OSMMN 08/07)